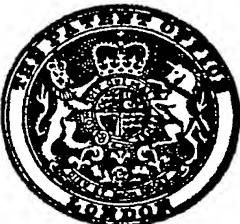


PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Security Device for Use in Security Papers

We, PORTALS LIMITED, a British Company, of Laverstoke Mills, Whitchurch, Hampshire, and DENIS SILVESTER OTTWAY, a British Subject, of Portals Limited, Laverstoke Mills,

5 Whitchurch, Hampshire, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:

10 The invention relates to security devices for use in security paper, for example, paper for bank-notes and cheques.

In Specification No. 237,828 there are described security papers containing fancy figured particles, which particles are designed to distinguish the papers. These particles may be made from, for example, paper wool made by cutting paper into strips of say 1.5 to 4 millimetres wide and 10 to 40 millimetres long, which strips are cut up into pieces for incorporation into the paper. The pieces incorporated in the paper may have letters, figures, or designs printed on them, the size 20 of the letters, figures or designs being preferably such that a magnifying glass is required to decipher them.

25 Specification No. 440,421 discloses ribbons as security devices for incorporation into security papers. Typical ribbons are 0.5 mm. wide.

Specification No. 483,142 discloses ribbons built up of layers of artificial silk and non-corrodible metal, and in the specific Example 30 thereof the ribbon which does not receive its layer of metal by printing is 0.5 mm. wide whereas the ribbon which does receive its layer of metal by printing is 1/8" wide.

According to the present invention there is 35 provided a security device for use in security paper comprising a continuous fine security ribbon having a width of substantially 0.75 mm. and having printed thereon a design,

lettering or pattern comprising printed characters of a height of substantially 0.4 mm.

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The security devices of the invention are intended for incorporation into a security paper during manufacture by the technique commonly employed in the security-paper field.

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The invention thus also provides a security paper having a security device according to the invention incorporated therein.

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The invention further provides a method of making a security paper which method comprises printing a design lettering or pattern comprising characters of a height of substantially 0.4 mm. on a continuous sheet or web comprising paper, metal foil or plastics film material, sub-dividing the sheet or web into continuous fine security ribbons having a width of substantially 0.75 mm. and each having a characteristic design, lettering or pattern printed thereon, and thereafter incorporating the ribbons into paper.

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It will be understood that when reference is made herein to continuous fine security ribbons we mean ribbons having lengths of the order of thousands of feet.

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The minute characters may be printed in columns on the sheet so that regardless of slitting errors the finished ribbons each contain the required characteristic design, lettering or pattern throughout their length, but separated by spaces which are either blank or contain mutilated portions of the design concerned. If the sheet is a plastic film material such as Melinex or Cellophane (Registered Trade Marks) it is impossible to slit the material to a sufficiently narrow width with great enough accuracy to register with the printed characters, however, by appropriate staggering of columns the required design, lettering or pattern can be produced thus ensuring that any one length of fine ribbon has basically the same appearance as any other length.

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The fine security ribbons of the present

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invention may be made of paper, metal or plastics film (including regenerated cellulose film) and may comprise a laminate. For example, the laminate may comprise a central layer of reflecting material having a layer of transparent material on either side. The design, lettering or pattern may be printed on both the transparent layers. The design, lettering or pattern may be identical on both sides. The reflecting material may be a metal foil e.g. aluminium foil.

The printed characters are so small i.e. of a height substantially 0.4 mm as to be virtually indecipherable without the use of a lens or microscope, but such that they can be clearly distinguished when examined in this way.

The printing may be effected with different coloured inks so that the characteristic design, lettering or pattern has characters of two or more colours. At least one of the inks may be fluorescent or sensitive to a chemical reagent which causes the ink to change colour.

Following is a description by way of Example of methods of carrying the present invention into effect.

EXAMPLE

A continuous sheet fed from a roll of transparent Cellophane (Registered Trade Mark) film of thickness not exceeding 0.06 mm. was prepared by printing parallel columns of a name in micro-lettering by the photogravure method, alternate columns being displaced vertically by half the distance between successive lines. The lettering was 0.4 mm high. The sheet was then slit into fine ribbons for incorporation into security papers, the ribbons being 0.75 mm wide. Each of these ribbons had the name repeated throughout its length but separated by spaces which contained mutilated lettering.

A security paper for banknotes was then made with the fine security ribbons incorporated therein. The method employed for incorporating the ribbons was that described in British Patent Specification No. 440,421.

The above method produced a fine security ribbon and banknote paper where the micro-printed letters are only easily read (with the aid of a magnifying lens) from one side, the other side of course presenting a mirror image through the transparent Cellophane film. The lettering was more easily detected by transmitted light. It was found advantageous to make the ribbons 0.75 mm wide instead of 0.5 mm which is a commonly employed width for security ribbon, to accommodate the lettering satisfactorily.

The technique for enhancing the security value of a banknote or other document as described above with reference to the Example is not limited to the use of only one sheet, only one ink in the production of the micro characters, or even to the use of conventional

inks alone. For example, a fine ribbon which has the same appearance from either side may be produced by using the printing technique of the Example to apply lettering to both sides of a laminate, of which the central layer is aluminium foil and the other layers are of Cellophane transparent film. Such a fine ribbon, when in the paper, is superficially in appearance the same as the ordinary metal threads which are very widely used. However, the application of water or, better, a volatile solvent such as alcohol or petroleum ether, to paper containing a ribbon of this nature destroys temporarily the opacity of the paper layer and, because of the mirror-like behaviour of the aluminium foil, the printed characters can be easily read with a lens. Moreover, since both sides of the ribbon are printed in a similar fashion, the back and front of a note containing such a fine ribbon appear identical. In addition by printing the same sheet or roll several times with different coloured inks from rollers bearing different designs, an effect can be obtained which presents one appearance to the naked eye and quite a different appearance under a lens.

Further by using inks which have some special property, such as fluorescence or colours which are sensitive to chemical reagents, the range of changes of appearance, according to viewing conditions, can be greatly widened. For example the ink may contain a medium which fluoresces under ultra violet light, or the ink may be compound with phenol-phthalein which imparts a transient pink colour to the printed design when exposed to ammonia vapour.

An advantage of the security papers described herein is that each used such as a bank can have its own characteristic markings on the fine security ribbon. Consequently forging of the security paper is made more difficult.

WHAT WE CLAIM IS:—

1. A security device for use in security paper comprising a continuous fine security ribbon having a width of substantially 0.75 mm. and having printed thereon a design, lettering or pattern comprising printed characters of a height of substantially 0.4 mm.

2. A security device as claimed in claim 1 wherein the design, lettering or pattern is printed on the ribbon at intervals and separated by spaces which are either blank or contain mutilated portions of the design, lettering or pattern.

3. A security device as claimed in claim 1 or claim 2 wherein the ribbon comprises a laminate.

4. A security device as claimed in claim 3 wherein the ribbon comprises a central layer of reflecting material having a layer of transparent material on either side.

5. A security device as claimed in claim 4,

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wherein the central layer is of metal foil.

6. A security device as claimed in claim 4 or claim 5 wherein the design, lettering or pattern is printed on both the transparent layers.

7. A security paper having one or more security devices as claimed in any one of the preceding claims incorporated therein.

8. A security device as claimed in any one of claims 1 to 6 wherein the design, lettering or pattern is printed in inks of two or more colours.

9. A security device as claimed in claim 8 wherein at least one of the inks is fluorescent or sensitive to a chemical reagent which causes the ink to change colour.

10. A security paper having one or more security devices as claimed in claim 8 or claim 9 incorporated therein.

11. A method of making a security paper which method comprises printing a design lettering or pattern comprising characters of a height of substantially 0.4 mm on a continuous sheet or web comprising paper, metal foil or plastics film material, sub-dividing the sheet or web into continuous fine security ribbons having a width of substantially 0.75 mm. and each having a characteristic design, lettering or pattern printed thereon, and thereafter incorporating the ribbons into paper.

12. A method as claimed in claim 11 wherein the minute characters are printed in columns on the sheet or web, the columns being so arranged that when the sheet is slit into fine ribbons each ribbon contains the required characteristic design, lettering or pattern throughout the length of the ribbon, but separated by spaces which are either blank

or contain mutilated portions of the design, lettering or pattern.

13. A method as claimed in claim 11 or claim 12 wherein the design, lettering or pattern is printed on both sides of the sheet or web.

14. A method as claimed in claim 13 wherein the ribbon has a substantially identical design, lettering or pattern on each side.

15. A method as claimed in any one of claims 11 to 14, wherein the printing is effected with different coloured inks so that the characteristic design, lettering or pattern comprises two or more colours.

16. A method as claimed in claim 15 wherein at least one of the inks is fluorescent or sensitive to a chemical reagent which causes the ink to change colour.

17. A security paper when made by a method as claimed in any one of claims 11 to 14.

18. A security paper when made by a method as claimed in claim 15 or claim 16.

19. A security device for use in security paper substantially as hereinbefore described with reference to the specific Example.

20. A security paper substantially as hereinbefore described with reference to the specific Example.

21. A method of making security paper substantially as hereinbefore described with reference to the specific Example.

BOULT, WADE & TENNANT,
111 & 112, Hatton Garden, London, E.C.1.
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Agents for the Applicant(s).

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